# Installation & Maintenance Manual
EliteSolar Performer Series



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## Preface

This manual offers general installation and maintenance information of elite solar Performer photovoltaic modules (hereinafter called the Modules) of elite solar GmbH (hereinafter called elitesolar).
Before installing our modules or any maintenance procedures, make sure you carefully read and understood all information in this manual and all general professional installation procedures of photovoltaic systems.
If you have any questions, please feel free to contact our customer support at any time during your installation.

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## Module types:

| | |
|---|---|
| ESP660250 white | ESP660250 black |
| ESP660260 white | ESP660260 black |
| ESP672300 white | ESP672300 black |
| ESP672310 white | ESP672310 black |
| ESM572190 white | ESM572190 black |
| ESM572200 white | ESM572200 black |
| ESM660250 white | ESM660250 black |
| ESM660260 white | ESM660260 black |
| ESM660275 white | ESM660275 black |

1. The last 3 digits in the table above are representing the module power in Wp(=/+ 5%). For detailed information, please check our module description sheet.
2. ES represents elite solar, while M is used for mono christalline cells and P for poly christalline or amorphe christalline cells.
3. The information in the table above also shows the cell backsheet color. Black cells will always have a reduced power of about 5Wp at the same cell amount and design as a result of the existing power loss. All module Wp statements are real Wp and will not be reduced for any further aspects.

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## General use:

1. The installation and maintenance of photovoltaic modules is always a potential risk because of dangerous voltages. Please make sure to work after all safety relevand electric installation rules and guidelines and make sure only proffessionals are installing the photovoltaic system.
2. Do not unmount the modules or parts of them and do not tear off any labels.
3. Do not touch the exposed cables or connectors. There is a high risk of flash shocks even without any other devices than the pv modules installed.
4. After unpacking the modules, make sure they are completely covered from the sunlight to avoid the risk of an electric shock. Monolithic modules may produce dangerous current or voltage being exposed to direct sunlight.
5. System designers and installers have to use a stable and prior calculated bracket to make sure the modules will be fixed safely to the roof. Fix the modules to the bracket according to the recommendation of the engineer or supplier (Please refer the 9th point of this Installation manual).
6. The installation, debugging and maintenance of the modules must be performed by following all electronic safety regulations for photovoltaic devices.
7. In standard test conditions (the standard test condition is: irradiance of 1000 W/m2, battery tag temperature of 25°C. and a spectrum of AM1.5), the electrical performance parameters of the Modules, such as Isc, Voc and Pmax may have a ±10% deviation with the nominal value.
8. Do not step or lean on the modules.
9. Do not spray any chemicals or paints on the modules.
10. When exchanging any module or in case of maintenance, please take all necessary precautions to avoid electrical injuries.

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## Transportation:

1. Always remember that pv modules are fragile goods. Please handle them with care.
2. Keep the modules away from inflammable gas, hazardous chemicals or fire sources.
3. Do not carry wet modules. Especially the glas surface is very slipperly when wet.
4. We strongly recommend to ship pv modules in suitable containers fill free spaces with inflatable bags. In case the modules cannot be shipped in a container, we recommend to single pack all modules and make sure they are well protected from outside impacts.
5. The surface oxide layer of the border may be scratched by sharp objects, do not destroy or scratch the border of the modules.

## Installation:

1. Installers must be qualified engineers. Do not try to install PV modules without an electronical profession.
2. Do not use damaged modules. Damaged modules may cause fire or electric shock; both may result in serious injury or death.
3. Do not disconnect any wires while the pv modules are producting electricity.
4. Under normal conditions, a photovoltaic module may produce voltages and currents higher than in standard test conditions. All connected electronic devices shall be able to work with 1.25 times higher current and voltage.
5. The Modules shall be installed in the position of highest sun irradiation to avoid low efficiency of the system to be installed. In the northern hemisphere, the modules shall be installed facing the south and vice versa.
6. Use a mounting bracket with a simular or higher maximum load to ensure a safe construction at heavy snowfall or strong winds. Make sure you choose a durable and safe bracket which is corrosion and UV resistant.
7. The electric installation must be designed by a registered professional engineer and installation procedures and designs must be in compliance with your countries laws for electronic installations.

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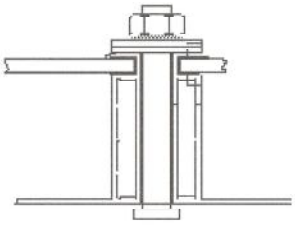
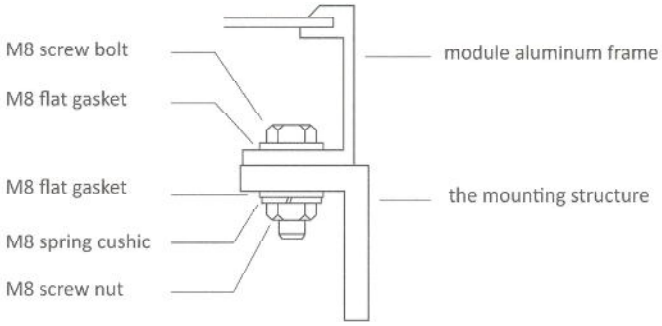
8. You may choose one of the fixing methods shown in the picture below.
Screw-fixing system (Drawing 1-a)..Fixture-fixing system(Drawing 1-b)or Inserting System.
M8 screw bolt module aluminum frame the mounting structure
M8 screw nut
M8 flat gasket
M8 flat gasket
M8 spring cushic



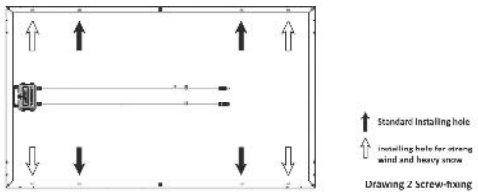
Drawing 1-b Installed by fixture




Drawing 1-a Installed by nut and bolt

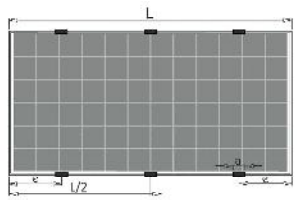
Drawing 1-a Installed by nut and bolt
Drawing 1-b Installed by fixture
* * Note: The percentage of the safety factor for voltage, current etc. is depending on the geographical conditions the modules are installed in and may vary from country to country.

9. Installation method and location
A) Screw-fixing: fix the modules on the bracket on the bracket at 8 border prefabricated installation holes (Drawing2).

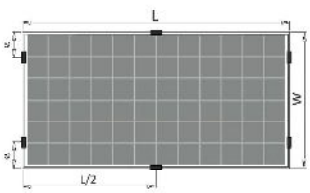



Drawing 2 Screw-fixing

B) Fixture-fixing: Fix the module safely and effectively on the brackets with special installation tools
a) A Series(156-72)modules , Six clamps must be used(Drawing 3)

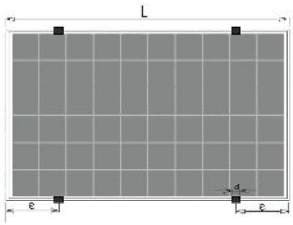



L/8≤e≤L/4, a≥8cm
Drawing 3-a on long frame

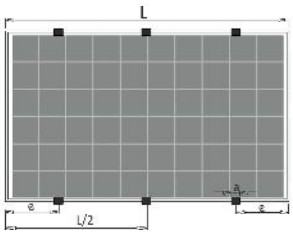



w/8≤e≤w/4, a≥8cm
Drawing 3-b on short frame

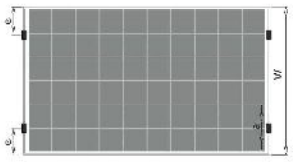
b) For other series module, fix the module with the long side (Drawing 4 - a ) or short side (Drawin 4-b) according to the bracket designation and mechanical load requirement.




L/8≤e≤L/4, a≥8cm 2400 Pa
Drawing 4-a fixing on the long side for the other module series




L/8≤e≤L/4, a≥8cm 2400 Pa
Drawing 4-a fixing on the long side for the other module series




w/8≤e≤w/4, a≥8cm 2400 Pa
Drawing 4-b fixing on the long side for the other module series

Anyway fix eight installation holes simultaneously is recommended according to the Security Considerations. In the correct installation method, the Modules could biggest bear snow pressure of 5400pa or wind pressure of 2400pa.

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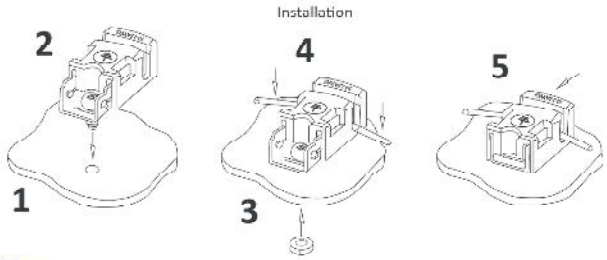
10. When installing the modules on the roof, ensure there is an appropriate structure which has the same or higher maximum load than the modules themself. Make sure there is no water leaking between the mounting brackets and roof construction.
11. Installing the modules on the roof may affect the fire risk rating of the house . It may be necessary to recalculate the rist class, insurance etc.
12. The grounding method shall be corresponding with the local standards and regulations. The grounding wire shall be the bare copper wire with simple surface treatment and no insulation. Wire thicknesses of 10,12 AWG or higher may be used. Ground clamp (Tyco, identification of product: 1954381-2)..is recommended:
13. When the connecting wire of the modules can not meet the system design requirements, a proper commercial cable for long-term outdoor use and suitable connector shall be used to extend the connecting wire. The extended wire shall be no less than 4mm², and the connection system shall meet IP65 rating.




14. The minimum space between two Modules shall be more than 10mm; when installed on the roof, the minimum separation between the Modules and the mounting surface shall be more than 150mm, and when installing on the ground, more than 450mm.
15. It is recommended to only use modules of the same electrical parameters in one system. Maximum number of series (N)=Vmax System /[ Voc (under the lowest temperature in local environment)] and meets the voltage range of the MPPT of the inverter.
16. Artificially concentrated sunlight may not be directed to the modules.
17. Our modules have passed the salt mist and ammonia test (Please refer the test report for detailed information) and may e installed even in more critical environment, e.g. at the sea side.
Please do not remove any label. A non labeled module will void warranty and may not be exchanged in case of damages.
For annual inspection :
1. Check if nuts and bolts of the mounting structure are securely tightened and not loose. Tighten the loose components, if necessary.
2. Check the water resistance of the connectors cables and ground cables as well as the ground resistance.
3. Check all electrical and mechanical connections for its proper location and corrosion.
4. Check the ground resistance of all metal parts such as the module frames and the mounting structures.

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